The minimum seems to have been about 28·1 inches; at Camden Square, London, where the lowest reading was 28·247 inches. The only lower readings there since 1858 have been: 28·332 inches on January 24, 1872; 28·364 inches on December 4, 1876; and 28·295 inches on December 9, 1886.—Severe frost in December 1899. A table shows the number of shade minima below 15°. Near Hereford a temperature of −2° was recorded on the 15th in a screen of the Stevenson pattern. At Lyme Regis, Dorset, a correspondent writes that some soda-water bottles which were opened on the golf links all instantly froze; before being opened they were perfectly fluid and free from ice.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 7, 1899.—"*Polytremacis* and the Ancestry of the Helioporidæ." By J. W. Gregory, D.Sc. Communicated by Prof. Lankester, F.R.S.

The recent blue coral *Heliopora* presents striking resemblances in structure to the palæozoic *Heliolites*. All the earlier writers on corals accordingly regarded the two genera as intimately allied But some later authorities consider the resemblances as accidental, and that the corals have no special affinities. Thus, according to F. Bernard, *Heliopora* and *Heliolites* belong to distinct subphyla. Lindström admits only one species of *Heliopora*, and regards the genus as quite isolated, as essentially distinct in structure from *Heliolites*, and as further separated from the latter by "the total absence of all connecting links from the end of the middle Devonian to the recent times." The author, however, considers that the original view of the close affinity of *Heliopora* and *Heliolites* is correct, that the two genera are essentially similar in structure, and that they are linked by a series of eocene and cretaceous corals. Amongst these fossils is the genus *Polytremacis*, which is redescribed, and a new species of *Heliopora* from the cretaceous of Somaliland. It is suggested that *Heliopora* has descended from the palæozoic Heliolitidæ by degeneration in size and increase in number of the cœnenchymal cæca.

"On the Association of Attributes in Statistics, with Examples from the Material of the Childhood Society, &c." By G. Udny Yule. Communicated by Karl Pearson, F.R.S.

Geological Society, January 10.—W. Whitaker, F.R.S., President, in the chair.—On a particular form of surface, the result of glacial and subaërial erosion, seen on Loch Lochy and elsewhere, by Dr. W. T. Blanford, F.R.S. This form of surface, first noticed by the author on Lake Como, was afterwards observed in the Great Glen of Scotland and in British Columbia. It consists of an almost even plane sloping at a moderate or high angle, and cut at intervals by small ravines or channels. The sides of the Great Glen have been planed by glacier-action to a greater extent than usual, and between Loch Lochy and Loch Oich, near Laggan, the sides of the Glen have a regular and flat slope of over 35° up to about 1000 feet above sea-level. Numerous stream-cut channels draining down this slope are, on an average, not more than 10 to 15 feet deep, but some quite exceptional examples may be 50 feet deep; these channels occupy less than a fourth of the surface. In addition there are larger glens which, although they run out into shallow ravines where they cut the sloping side of the Great Glen, are frequently 500 feet in depth among the hills. If these were ordinary stream-valleys before the Glacial Period, the cutting away of the ridges separating them to the extent of at least 250 or 300 feet must be attributed to glacial erosion on the sides of the Great Glen. The erosion of the small ravines in the glacial slope must have been effected by streams in post-Glacial times, and the measurement of their rate of erosion might be expected to throw light on the amount of time which has elapsed since the Glacial Period in this district. "The general effect produced by the whole evidence is . . . the small amount of denudation that has taken place since the Great Ice Age, and the necessary deduction that no great period of time, measured in years, can have elapsed between the Glacial Epoch and the present day."—On the geology of Northern Anglesey (Part II.), by C. A. Matley.—The formation of dendrites, by A. Octavius Watkins. If two plane-surfaces be separated by a film of suitable plastic material, and one surface be rotated slowly on the other through a small arc, the plastic material collects into branching forms similar to the structure of dendrites. The dendritic form starts from the part farthest from the axis, and the flow of material is from the smaller to the larger branches, the smaller uniting to form the larger. The author explains dendritic structure by the formation of a fissure in rock which becomes filled with a thin film of dendritic material; if the fissure is slowly widened, the dendrite starts where the widening commences, coinciding dendrites being formed on each wall.

Royal Meteorological Society, January 17.—Annual Meeting.—Mr. F. C. Bayard, President, in the chair.—In his presidential address, Mr. Bayard discussed the meteorological observations made at the Royal Observatory, Greenwich, during the fifty-one years 1848–1898, and brought out in a novel way many interesting features in the variability of the various observations of the barometer, maximum and minimum temperatures, relative humidity, direction of the wind and rainfall. These were shown in a diagrammatic form on the screen by means of a number of lantern slides. The address was also illustrated by various views of the Royal Observatory and of the instruments employed.—Mr. G. J. Symons, F.R.S., was elected President for the ensuing year.

PARIS.

Academy of Sciences, January 15.—M. Maurice Lévy in the chair.—On the distribution of the abnormal residues of a function, by M. H. Padé.—On the reduction of an algebraical problem, by M. J. Ptaszycki.—Determination of the invariants attached to the group G_{168} of M. Klein, by M. A. Boulanger.—Vector fields and fields of force. Reciprocal action of scalar and vectorial masses.—Localised energy, by M. André Broca.—On the distribution of potential in a heterogeneous medium, by M. A. A. Petrovsky.—On the co-volume in the characteristic equation of fluids, by M. Daniel Berthelot. A comparison of the experimental isotherms for carbon bisulphide, ethyl chloride, carbon dioxide and ethylene with various modifications of the Van der Waals formula. If the co-volume b be regarded as a function of the temperature, the Van der Waals equation can be made to represent well the liquid state. The formula proposed by the author is $b_1 = b_c\left[1 + 0{\cdot}3\left(\frac{T}{T_c} - 1\right)\right]$, where b_T is the co-volume at T, b_c that at the critical temperature, T_c.—On the mechanism of hearing, by M. Firmin Larroque. For a simple sound, whether the wave phases are concordant or not, the centre of perception receives two transmitted impressions together, there being no interference in any case. For two simple or complex sounds, two corresponding impressions are received by the centre of perception, there being neither beats nor resultants, the two ears being acoustically distinct.—The permanent modifications of metallic wires and the variation of their electrical resistance, by M. H. Chevallier. If the resistance of a wire is R at a temperature T_0, then heated to T, and again measured at T_0, in general, the resistance R′ last measured will be different from R. The phenomenon appears to be due to a tempering effect, and is most clearly marked with metals and alloys that have not been hardened. The effect is very marked with ordinary platinum-silver wire.—On the Hall phenomenon and thermomagnetic currents, by M. G. Moureau. The thermomagnetic currents discovered by Nernst and Ettingshausen in 1886 to exist in a thin metallic plate placed in a magnetic field normally to the lines of force and traversed by a heat current. Several attempts have been made to explain these phenomena, by hypotheses resting upon numerous arbitrary assumptions. The author now shows that these results are an immediate consequence of the Hall effect, the values calculated from this point of view agreeing extremely well with the experimental numbers, except in the cases of nickel and cobalt, which require further investigation.—On the discharge of electrified bodies and the formation of ozone, by M. P. Villard. The author concludes from his experiments that in ordinary air incandescent bodies may emit kathode rays comparable to the Lénard rays, but of very low voltage. If this is the case, several distinct phenomena can be explained; the power of discharging electrified bodies possessed by flame, incandescent bodies and phosphorus; the discharge by ultra-violet light, the production of ozone by flames, incandescent bodies, oxidation of phosphorus, electric sparks, and by radium.—On a method of measuring the velocity of the Röntgen rays, by M. Bernard Brunhes. The ordinary methods of measuring the velocity of light cannot be used with the X-rays since they are not reflected, but by applying the discovery of M.

Swyngedauw of the effect of the X-rays upon the discharge of bodies just below their ordinary sparking potential, it has proved to be possible to obtain comparative measurements of the velocity, which would appear to be of the same order as ultra-violet light.—On the nature of white light and the X-rays, by M. E. Carvallo.—The numerical laws of chemical equilibrium, by M. O. Boudouard. The formula of Le Chatelier is applied to the reaction $CO_2 + C \rightleftarrows 2CO_2$, and the composition of the gas mixture calculated for temperatures between 450° C. and 1050° C.—On the electrolysis of potassium chloride, by M. A. Brochet. The yield of chlorate is considerably increased by the presence of a little potassium bichromate in the solution. Curves are given showing the amounts of chlorine present as hypochlorite, chloride, and chlorate after a varying number of ampère hours.—On a new crystallised molybdenum sulphide, by M. Marcel Guichard. By heating molybdenum bisulphide in the electric furnace a lower sulphide, Mo_2S_3, is produced, which can be obtained as long steel-grey needles from the melted mass by treatment with aqua regia. Heated to a red heat in sulphur vapour the bisulphide is reformed; at higher temperatures it is dissociated into sulphur and molybdenum.—The action of magnesium upon saline solutions, by M. Henri Mouraour.—Automatism of the nerve cells, by M. Pompilian. Curves are given for the automatic movements observed in *Dytiscus Marginalis*. The author concludes that nerve cells are constantly disengaging nervous energy, without any excitement being required, and hence that nervous activity is really automatic, although varying in intensity with time. The higher nervous centres under normal conditions exert a controlling influence over the lower centres, the activity of the latter being clearly shown when the former are removed. Hence it would appear in pathology that the tremors may be explained either by a diminution of the controlling power exercised by the higher cerebral centres upon the lower medullary centres, or by an increase of activity of the latter.—On a category of crystalline groups escaping optical investigations, by M. Fred. Wallerant. In general, in a crystalline grouping, the different crystals can be easily distinguished, their ellipsoids of optical activity having different orientations. If, however, the orientation of the crystals are symmetrical with respect to the elements of symmetry of this ellipsoid, it will be impossible to distinguish them by polarised light. Cumenglite and chiastolite are considered as examples.—On the denudation of the central plateau of Haye, or Forêt de Haye, by M. Bleicher.—On the presence of the Upper Eocene in Tunis, by M. Flick.

DIARY OF SOCIETIES.

THURSDAY, JANUARY 25.

ROYAL SOCIETY, at 4.30.—Mathematical Contributions to the Theory of Evolution—On the Law of Reversion: Prof. K. Pearson, F.R.S.—(1) On the Mechanism of Gelation in Reversible Colloidal Systems: (2) A Preliminary Investigation of the Conditions which determine the Stability of Irreversible Hydrosols: W. B. Hardy.—On the Effects of Strain on the Thermo-electric Qualities of Metals, Part II.: Dr. M. Maclean.—On the Periodicity in the Electric *Touch* of Chemical Elements. Preliminary Notice: Prof. J. C. Bose.

ROYAL INSTITUTION, at 3.—The Senses of Primitive Man: Dr. W. H. R. Rivers.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Adjourned Discussion on the Report of the Institution's Visit to Switzerland.—*And if time permit*: An Electrolytic Centrifugal Process for the Production of Copper Tubes: Sherard Cowper-Coles.

FRIDAY, JANUARY 26.

ROYAL INSTITUTION, at 9.—Motive Power, High Speed Navigation, Steam Turbines: Hon. C. A. Parsons, F.R.S.

PHYSICAL SOCIETY, at 5.—Some Developments in the Use of Price's Guard Wire in Insulation Tests: Prof. Ayrton and Mr. Mather.—Reflection and Transmission of Electric Waves along Wires: Dr. E. Barton and Mr. L. Lownds.—The Frequency of the Transverse Vibrations of a Stretched India-rubber Cord: T. J. Barker.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Water Meters of the Present Day, with special reference to Small Flows and Waste in Dribbles: William Schönheyder.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Simplon Tunnel: C. B. Fox.

SATURDAY, JANUARY 27.

MATHEMATICAL ASSOCIATION (University College, Gower Street, W.C.), at 2.—Dynamical Applications of the Theory of Correspondence: Sir Robert S. Ball.—Triangles Triply in Perspective: J. A. Third.—The Teaching of Indices and Surds: Prof. R. W. Genese.—Illustrations of Porismatic Equations: T. J. Bromwich.—A Note on the Focoids: R. F. Davis.

ESSEX FIELD CLUB, at 3.—Visit to Museum of College of Surgeons. Conductor: Prof. C. Stewart, F.R.S.

MONDAY, JANUARY 29.

SOCIETY OF ARTS, at 8.—The Nature and Yield of Metalliferous Deposits: Bennett H. Brough.

INSTITUTE OF ACTUARIES, at 5.30.—Increasing Reversionary Charges: W. B. Paterson

TUESDAY, JANUARY 30.

ROYAL INSTITUTION, at 3.—Structure and Classification of Fishes: Prof. E. Ray Lankester, F.R.S.

ANTHROPOLOGICAL INSTITUTE, at 8.30.—Anniversary Meeting.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Steamers for Winter Navigation and Ice-breaking: Robert Runeberg.

WEDNESDAY, JANUARY 31.

SOCIETY OF ARTS, at 8.—The Undeveloped Resources of the Bolivian Andes: Sir W. Martin Conway.

THURSDAY, FEBRUARY 1.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: A Case of Monochromatic Vision: Sir W. de W. Abney, F.R.S.—Thermal Radiation in Absolute Measure: Dr. Bottomley, F.R.S., and Dr. Beattie.—Electrical Conductivity in Gases traversed by Kathode Rays: Dr. McLennan.

ROYAL INSTITUTION, at 3.—The Senses of Primitive Man: Dr. W. H. R. Rivers.

LINNEAN SOCIETY, at 8.—On Botanic Nomenclature: C. B. Clarke, F.R.S.—On the Zoological Results of an Expedition to Mount Roraima, in British Guiana, undertaken by Messrs. F. V. McConnell and J. J. Quelch: Prof. E. Ray Lankester, F.R.S.

CHEMICAL SOCIETY, at 8.—The Chlorine Derivatives of Pyridine. Part V. Synthesis of $\alpha\alpha'$-Dichlorpyridine. Constitution of Citrazinic Acid: W. J. Sell and F. W. Dootson.—The Formation of Heterocylic Compounds: S. Ruhemann and H. E. Stapleton.—The Space Configuration of Quadrivalent Sulphur Derivatives: Methyl Ethyl Thetine Dextrocamphorsulphonate, and Dextrobromocamphorsulphonate: W. J. Pope and S. J. Peachey.—Nitrocamphane: M. O. Forster.

RÖNTGEN SOCIETY, at 8.—Röntgen Rays in Diseases of the Chest: Dr. Hugh Walsham.—Mr. A. Hastings Stewart will show a small Egyptian Mummy and Skiagrams of the same.

FRIDAY, FEBRUARY 2.

ROYAL INSTITUTION, at 9.—Wireless Telegraphy: G. Marconi.

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